

Work Order ID 71488

Tuesday, July 05, 2011 7:43:57 AM



Page 1

Item ID: D212-664-201

Accept



Setup Start



Revision ID: ~~U/R~~

Stop



Item Name: Crosstube Aft

Start Date: 7/5/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 7/25/2011 Req'd Qty: 1.00

Customer:

Reference:

Approvals: Process Plan: CL Date: 11/07/05

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
D212-664-241	Rev D U/R								

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile and create labels as per PPP D212-664-201

CHG004

CHG005 8/10/05

110

0.00



Pick Kit

Packaging

Memo

0.00

Packaging

Packaging

DP

11-7-27

120

0.00



BENDING MACHINE - CROSSTUBES

CNC Bend 2

Memo

0.00

CNC Alpha 160 Bender

Bend tube as per Dwg D212-664-241 using CNC bender program 212-
aft

DP

11-7-27

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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Customer:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130  QC Quality Control	QC15- Crosstube Dimensional Check Memo	0.00 0.00				①	②	11-07-27	
140  Crosstubes Crosstubes	Crosstubes Memo	0.00 0.00				③			
1-Drill pilot holes in tube as per Dwg D212-664-241 using drill Jig DT8550, DT8551, drill table DT8577 and locate tower holes #8 as per QSI0010.									
2-Ream hole to finish size in tube as per Dwg D212-664-241 using drill Jig DT8550 & DT8551. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes.									
3-Scribe part # and batch # using vibrating stylus as per Dwg D212-664-241									
4-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-241									

SMD 11-07-27
TW

W/O:		WORK ORDER CHANGES					
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Reference:

Cust Item ID:




Customer:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
180  Outsource2	Outsource process - NDT per QSI038 4.1	0.00							
Outsource process - NDT	Memo Liquid Penetrant Inspection as per QSI 038 Issue P/O: <u>14608</u> LPI as per ASTM 1417 Level 2 Attach copy of NDT results to work order	0.00							<u>11-08-2</u>
190  Packaging	Receive & Inspect for Damage & Mat'l Certs	0.00							
Packaging	Memo Ensure copy of NDT results attached to work order.	0.00							<u>11-07-21</u>
200  QC	QC5- Inspect part completeness to step on W/O	0.00							
Quality Control	Memo Inspect for damage & ensure results are as per Dwg D212-664-241	0.00							<u>11-07-21</u>

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Required Date: 7/25/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

210



SprayPaint

Spray Painting

Spray Painting per QSI005 4.2

0.00

SprayPaint

Memo

0.00

1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube as per DEO D212-667-241 with White Imron as per QSI 005 4.2

PRIME:

Start Time: _____

Finish Time: _____

11-08-02

PAINT:

Start Time: _____

Finish Time: _____

11-08-03

81 11-08-03

220



QC

Quality Control

QC14- Inspect Spray Paint

0.00

Memo

0.00

Then, Wrap in plastic bag to protect from scratches

Sullosloy

(20)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Required Date: 7/25/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

230

0.00



Crosstubes

Crosstubes

Memo

0.00

Crosstubes

1- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe

2-Install supports with magnobond as per QSI 015 Adhere for for 12 Hrs
A/R 6398 Magnobond Batch: 118234

proseal

Expiry Date: 11-11

3-Install clamps as per Dwg D212-664-241. Torque clamps to 80-100 in lb.

★ USE PROSEAL
SER ATTACHED

RT 11-08-04

240

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

①

11-08-05

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
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Cust Item ID:

Required Date: 7/25/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
250 Packaging Packaging	Pick Kit Memo	0.00 0.00							
260 QC Quality Control	QC4- 100% Inspect kits for completeness Memo	0.00 0.00							
270 Packaging Packaging	Packaging Memo Identify and pack for shipping as per PPP D212-664-201	0.00 0.00							

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Item Name: Crosstube Aft

Start Date: 7/5/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 7/25/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

280

QC21 - Final Inspection - Work Order Release

0.00



QC

Memo

0.00

Quality Control

OK 11/08/05

81108-5

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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NOTE: Date & initial all entries

Picklist Print

Tuesday, July 05, 2011 7:43:54 AM

Page 1

Work Order ID: 71488

Parent Item: D212-664-201

Parent Item Name: Crosstube Aft



Start Date: 7/5/2011

Required Date: 7/25/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:E 04.02.16 Reformat K/DS
 IPP Rev:F 06-03-29 Remove Comments on Pick List JLM
 IPP Rev:G 07-04-30 As per Rev C JLM
 IPP Rev:H 08-05-22 up date Qty of rubber cushion DD verified by:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D212-664- 201TRNRevC		Manufactured	No				Each	0.0000	1				
Crosstube Turning Detail													
D3595-063-530		Manufactured	No			230	Each	74.0000	2				
RUBBER CUSHION													

Location	Loc Qty	Loc Code
LG	56	
70067	56	
LG055	18	
63407	6	
67185	12	

D2940-1 Manufactured No



Support

Location	Loc Qty	Loc Code
LG	17	
70737	17	

B68805

72587

① 11-7-27

2 11-08-04

2 11-08-04

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Picklist Print

Tuesday, July 05, 2011 7:43:54 AM

Page 2

Work Order ID: 71488

Parent Item: D212-664-201

Parent Item Name: Crosstube Aft

Start Date: 7/5/2011

Required Date: 7/25/2011

Start Qty: 1.00

Required Qty: 1.00

MS21920-28

Purchased

No

230

Each

55.0000

4

4



Clamp(per MIL-DTL-8783C)

Location

Loc Qty

Loc Code

FG

5

105884

5

LG050

50

116839

2

117344

5

117998

43

D3428-1

Manufactured

No

250

Each

20.0000

1



Placard

Location

Loc Qty

Loc Code

ST053

20

68920

10

71168

10

MS21042L6

Purchased

No

250

Each

341.0000

6



Nut

Location

Loc Qty

Loc Code

ST300

341

117343

41

117677

200

118078

100

AN960JD616

NAS1149D0663J

Purchased

No

250

Each

0.0000

18

18



Washer

Tuesday, July 05, 2011 7:43:54 AM

Shop Packet Print

Page 2

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Picklist Print

Tuesday, July 05, 2011 7:43:54 AM

Page 3

Work Order ID: 71488

Parent Item: D212-664-201

Parent Item Name: Crosstube Aft



Start Date: 7/5/2011

Required Date: 7/25/2011

Start Qty: 1.00

Required Qty: 1.00

AN6-40A



Bolt

Purchased

No

250

Each

96.0000

4



4

Location

Loc Qty

Loc Code

ST340

46

117366

46

ST343

50

117688

50

X

AN6-41A



Bolt

Purchased

No

250

Each

58.0000

2



2
11/8/15

Location

Loc Qty

Loc Code

ST344

58

117366

48

118191

10

2

Tuesday, July 05, 2011 7:43:55 AM

Shop Packet Print

Page 3

W/O:		WORK ORDER CHANGES					
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NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order: 71488
Description: Crosstube Assembly (205/212 High Aft)	Part Number: D212-664-241
Inspection Dwg: D212-664-241 Rev: D	Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

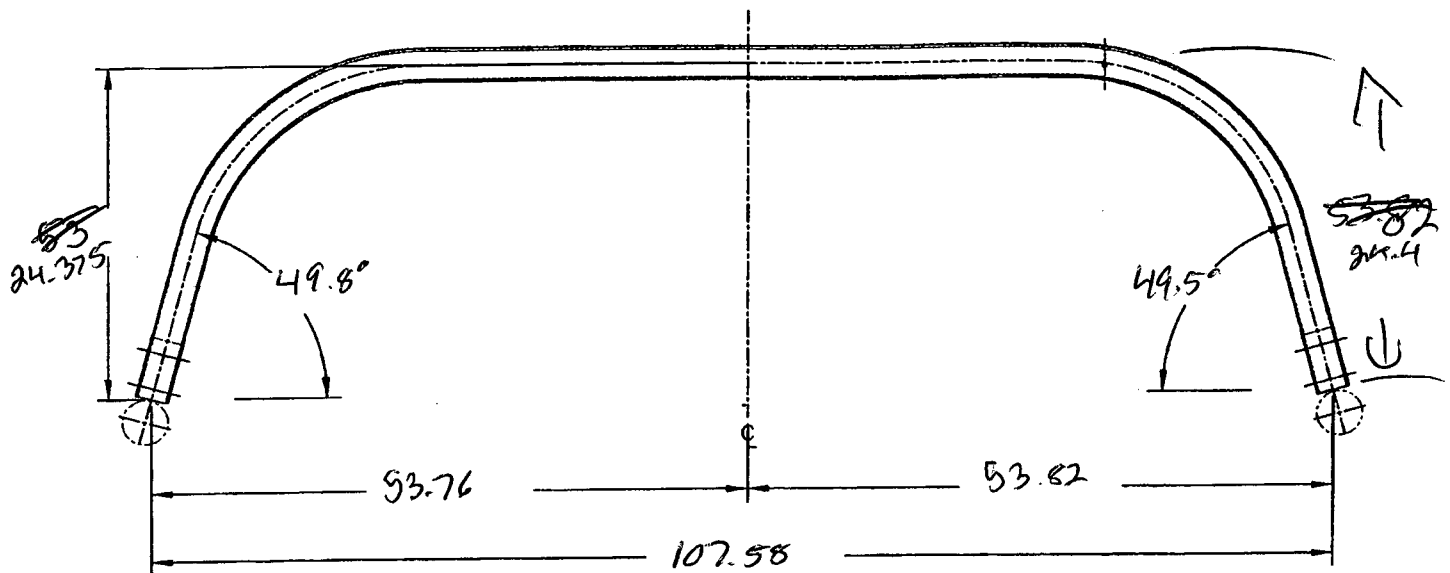
Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	0.200	+/-0.010				
	R0.063	+/-0.010				
	2.990	+0.005/-0.000				
	5.237	+/-0.030				
	2.600	+0.005/-0.000				
	2.686	+0.005/-0.000				
	2.770	+0.005/-0.000				
	2.854	+0.005/-0.000				
	2.938	+0.005/-0.000				
	3.021	+0.005/-0.000				
	3.133	+0.005/-0.000				
	3.179	+0.005/-0.000				
SIDE B	0.200	+/-0.010				
	R0.063	+/-0.010				
	2.990	+0.005/-0.000				
	5.237	+/-0.030				
	2.600	+0.005/-0.000				
	2.686	+0.005/-0.000				
	2.770	+0.005/-0.000				
	2.854	+0.005/-0.000				
	2.938	+0.005/-0.000				
	3.021	+0.005/-0.000				
	3.133	+0.005/-0.000				
	3.179	+0.005/-0.000				
	124.362	+/-0.020				

Measured by:		Audited by:		Preliminary Approval:	N/A
Date:		Date:		Date:	N/A

Rev	Date	Change	Revised by	Approved
A	05.04.27	New Issue (P/O D412-664-201)	KJ/JLM	
B	06.03.09	Tolerance for 5.237 was +/-0.001	KJ/JLM	
C	07.05.08	Dwg Rev. updated	KJ/JLM	
D	10.08.03	Dimension 124.362 was 124.36	KJ	

DART AEROSPACE LTD		Work Order:	71488
Description: Crosstube High Aft (205/212)		Part Number:	D212-664-201
Inspection Dwg: D212-664-241 Rev: D		Page 1 of 1	

Required Dimension	Min	Max
Height	24.17	24.43
1/2 Span	53.59	53.85
Angle	49	52
Total Span	107.18	107.70



Part 21	Comments

QC15 Inspection	11.07.27
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	07.05.08	Dimensions updated per Dwg rev. C	KJ/JLM	
C	10.04.01	Dwg Rev updated	KJ	

D212-664-201 71488 2011-604

8 7 6 5 4 3 2 1



Item	Qty -241	Qty -241B	Part Number	Description
1	X		D212-664-241	CROSSTUBE ASSEMBLY (205/212 HIGH AFT)
2		X	D212-664-241B	CROSSTUBE ASSEMBLY (214 HIGH AFT)
3	1	1	D6006-129	CROSSTUBE
4	2	2	D2940-1	SUPPORT
5	4	4	D3595-063-530	RUBBER CUSHION
6	4	4	MS21920-28	CLAMP (OR MS21920-30)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6006-129
FINISHED LENGTH = 124.362±0.020
- FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: D212-664-241 = 44.2 lbs (PER IIN-D212-664)
D212-664-241B = 44.2 lbs (PER IIN-D212-664)
- PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY. TRANSITION SHOULD BE SMOOTH.
- BEND PROGRESSIVELY WITH A MINIMUM OF 5 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D2940-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

600 #11-614
11.09.25

UNDER REVIEW

DEO ATTACHED

RELEASED
2009-10-29

D	REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -241B (ZN D4-2, B4-2); REMOVED REF & ADD TOLERANCES (ZN D8-3 & C4-3, C6-3 & A8-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A8-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
C	REMOVE -1009 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	PH	00.12.12
REV.	DESCRIPTION	BY	DATE
DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	PH	DRAWING NO.	REV. D
MFG. APPR.	PH	D212-664-241	SHEET 1 OF 4
APPROVED	PH	TITLE	SCALE
DE APPR.	PH	CROSSTUBE ASS'Y (205/212 HI AFT)	NTS
DATE	09.09.30	COPYRIGHT © 2000 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS UNDERSTANDING THAT IT IS NOT TO BE USED FOR ANY PURPOSES OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD	

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

12 13 15
 D2940-1 SUPPORT
 MS21920-28 CLAMP, 2X
 D3595-063-530 RUBBER CUSHION, 2X
 2 PL

A5-2

A

14.00 (-241)
 OR 13.75 (-241B)

D

D212-664-601
 BENT TUBE

SYM

D212-664-241/-241B
ASSEMBLY DETAIL

D

SC0411-614
 11.07.26

UNDER REVIEW

11.06.13

DEO ATTACHED

RELEASED
 2009-10-28

12
 APPLY MAGNOBOND
 BETWEEN D2940-1 AND
 CROSSTUBE

D2940-1 SUPPORT, REF

13 15
 MS21920-28
 CLAMP, REF

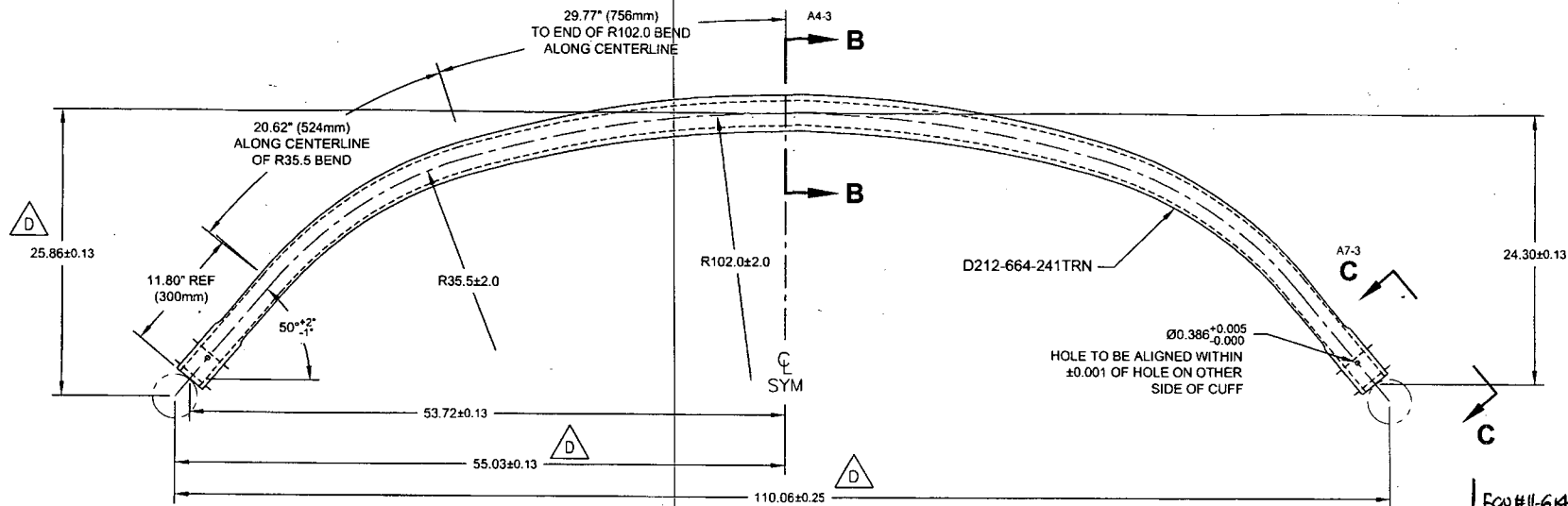
D3595-063-530 RUBBER CUSHION
 UNDER CLAMP, REF

SECTION A-A D6-2
 SCALE 4X

DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	PH	DRAWING NO.	REV. D
MFG. APPR.	PH	D212-664-241	SHEET 2 OF 4
APPROVED	PH	TITLE	SCALE
DE APPR.	PH	CROSSTUBE ASSY (205/212 HI AFT)	NTS
DATE	09.09.30	COPYRIGHT © 2000 BY DART AEROSPACE LTD	
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8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1



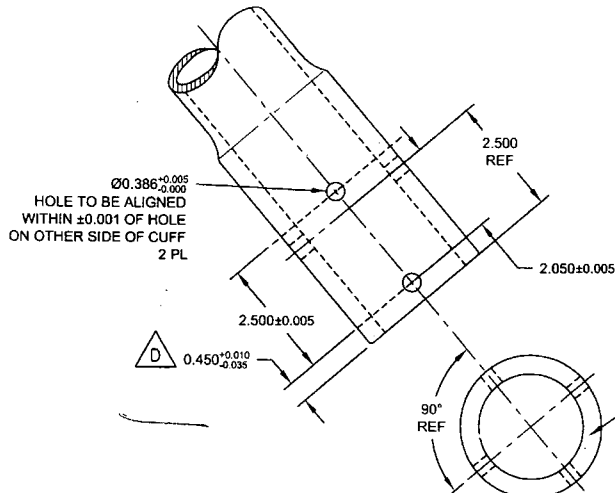
D212-664-601 10 D
BENDING AND DRILLING DETAIL

ECU#11-614
 1607.26

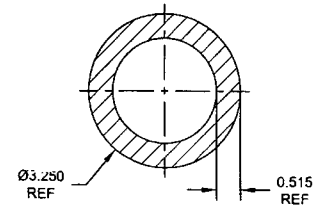
UNDER REVIEW
9/11/08

DEO ATTACHED

RELEASED
 2009-10-29



VIEW C-C: CUFF DETAIL D2-3
 SCALE 3X



SECTION B-B D4-3
 SCALE 4X

DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	9	DRAWING NO.	REV. D
MFG. APPR.	10	D212-664-241	SHEET 3 OF 4
APPROVED	11	TITLE	SCALE
DE APPR.	12	CROSSTUBE ASS'Y (205/212 HI AFT)	NTS
DATE	09.09.30	COPYRIGHT © 2000 BY DART AEROSPACE LTD	
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8 7 6 5 4 3 2 1

DRAWING NO. D212-664-241	TITLE CROSSTUBE ASSY (205/212 HI AFT)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-241-D-1	SHEET NO. SHEET 1 OF 2	SCALE NTS
DRAWN	CHECKED	MFG. APPR.	APPROVED	DE APPR.			
DATE 11.04.07	DATE 11.04.11	DATE 11.04.12	DATE 11/04/12	DATE 11.04.12			

PURPOSE:

ADD AN INSPECTION WINDOW TO UNDERSIDE OF CROSSTUBE.

CHANGE:

NOTES 2 OF SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND
PAINT OUTSIDE PER DART QSI 005 4.2
REMOVE MASKING AND APPLY CLEAR COAT

WAS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2

RELEASED
2011-04-18

UNDER REVIEW

11.16.13

RCN#11-614

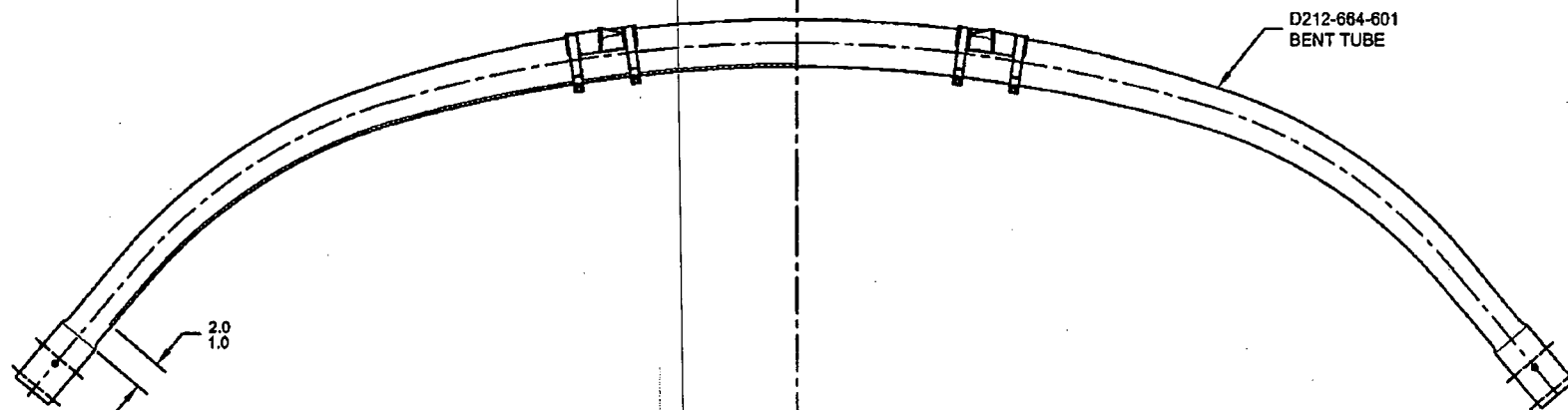
11.07.28

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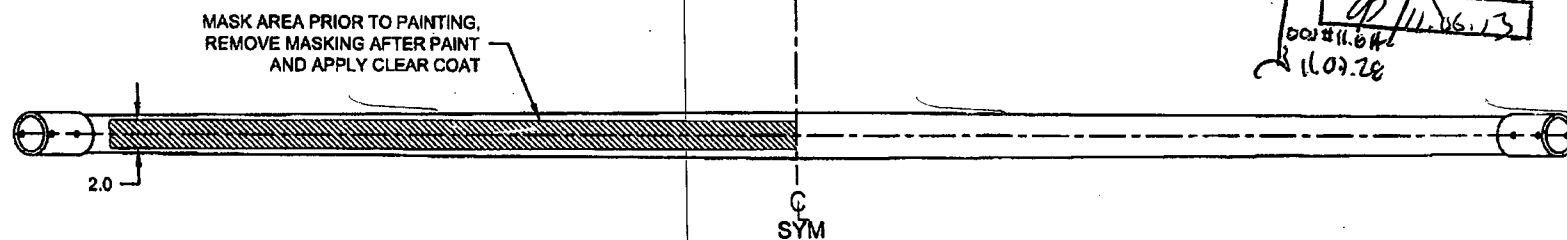
DRAWING NO. D212-664-241	TITLE CROSSTUBE ASSY (205/212 HI AFT)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-241-D-1	SHEET NO. SHEET 2 OF 2	SCALE NTS
DRAWN	CHECKED <i>CP</i>	MFG. APPR. <i>E</i>	APPROVED <i>MD</i>		DE APPR. <i>MD</i>		
DATE 11.04.07	DATE 11.04.11	DATE 11.04.12	DATE 11/04/12		DATE 11.04.12		

IS:



WAS:

D212-664-241/-241B
ASSEMBLY DETAIL



RELEASED
2011-04-18
MD

UNDER REVIEW

CP 11.06.13
D212-664-241
11.07.28

DRAWING NO. D212-664-241	TITLE CROSSTUBE ASS'Y (205/212 HI AFT)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-241-D-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>qp</i>	CHECKED <i>ASS</i>	MFG. APPR. <i>DS</i>	APPROVED <i>MD</i>		DE APPR. <i>MD</i>		
DATE 11.07.15	DATE 11.07.20	DATE 11.07.21	DATE 11.07.21		DATE 11.07.21		

PURPOSE:

REPLACE MAGNOBOND WITH PROSEAL.

CHANGE:

IS:

Item	Qty -241	Qty -241B	Part Number	Description
7	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2

WAS:

7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)
---	-----	-----	----------------	---

NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

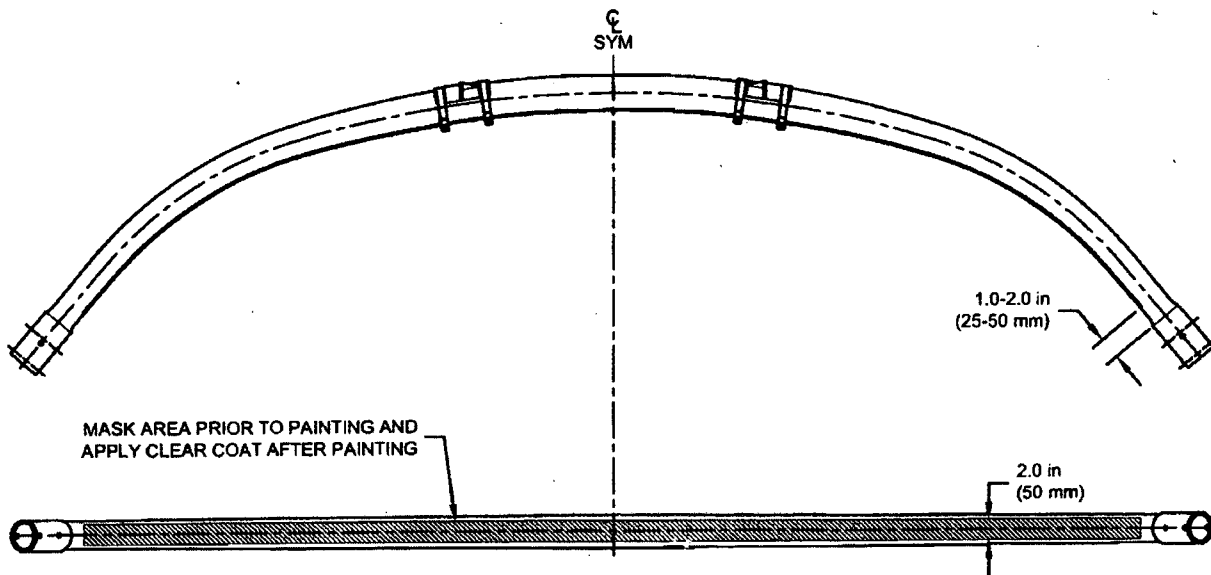
IS:

- 12) TO INSTALL D2940-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. **PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.**

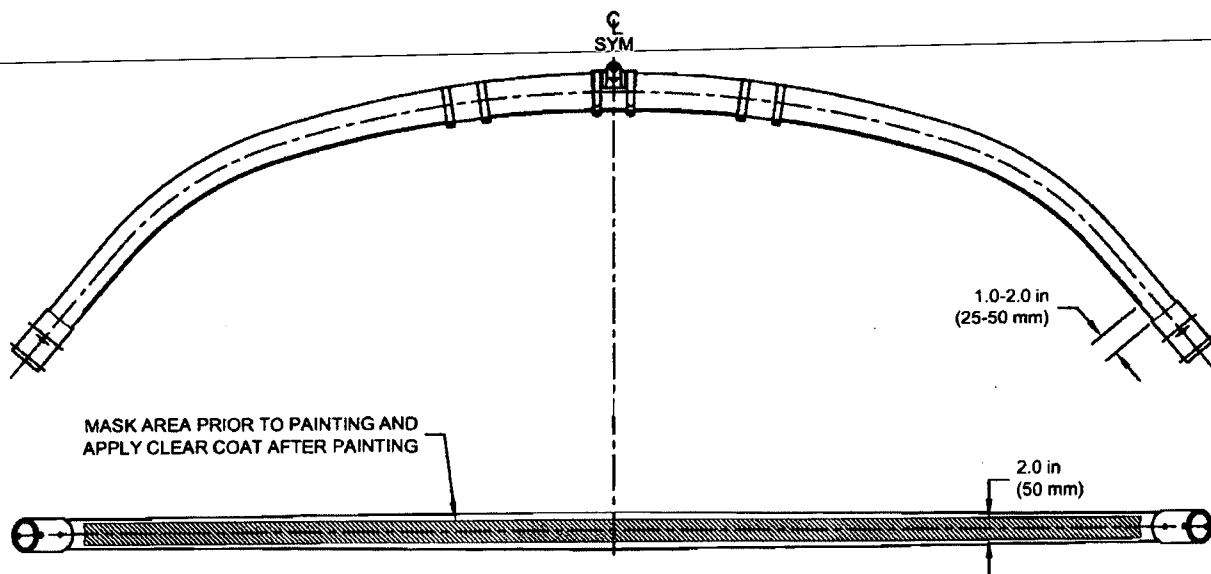
WAS:

- 12) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED
2011-07-28
MD



**FIGURE 1 - INSPECTION WINDOW ON
D212-664-101/-201 CROSSTUBES**





**FIGURE 2 - INSPECTION WINDOW ON
D412-664-203 CROSSTUBES**

C/L 11/07/05
W10: 71488

CANADA DEPARTMENT OF TRANSPORT AIRCRAFT CERTIFICATION BRANCH DAO # 01-O-01	
APPROVED	
BY:	<i>[Signature]</i>
D. SHEPHERD (DE # 02)	
DATE:	11.04.01
CERT. NO.:	SH01-9
ISSUE NO.:	3

DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		DSI 9549	SHEET 2 OF 3
APPROVED		TITLE	SCALE
DE APPR.		D212-664 FINISHING CHANGE	NTS
DATE	11.04.01	COPYRIGHT © 2011 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

W/O:		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	
11.07.05	230	BOND SUPPORTS USING PROSEAL PER ATTACHED PROCEDURE (EMAIL)	BT	11-08-04		 11.07.05 OS/042	 11.08.05	

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Chris Provencal

From: David Shepherd <dshepherd@dartaero.com>
Sent: Wednesday, June 15, 2011 3:05 PM
To: 'Chris Provencal'
Cc: 'Mike Petsche'; 'Dan Stow'; 'Eric Downing'; 'Linda Lacelle'
Subject: RE: Procedure for installing supports.

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Chris,

I agree with your procedure outlined below. It is our preference to leave the paint on the crosstube if we can for added corrosion protection (and for ease of manufacture). If Dan's final testing shows there is a big difference between a painted/unpainted crosstube, then we will switch to alodine only on the crosstube.

David

From: Chris Provencal [mailto:cprovencal@dartaero.com]
Sent: Wednesday, June 15, 2011 11:24 AM
To: 'David Shepherd'
Cc: 'Mike Petsche'; 'Dan Stow'; 'Eric Downing'
Subject: RE: Procedure for installing supports.

David,

Can I confirm that this is the agreed procedure for all newly manufactured tubes with off-center supports:

- Scuff paint under support, clean with MEK
- Completely remove any finish on support (if present), scuff bottom surface of support, clean with MEK
- Apply a 0.04" – 0.07" layer of Proseal 890 class B-2 on bottom of support and install wet.
- Install clamps and torque per dwg
- Clean up excess proseal
- Let cure for 72 hours after installation, recheck torque.

Chris

From: David Shepherd [mailto:dshepherd@dartaero.com]
Sent: Tuesday, June 14, 2011 10:59 AM
To: 'Chris Provencal'
Cc: 'Mike Petsche'; 'Dan Stow'; 'Eric Downing'
Subject: RE: Procedure for installing supports.

Made a couple of small changes.

- Remove finish on xtube in area of support down to alodine finish.
- Touch up alodine on xtube in affected area
- Completely remove any finish on support, scuff bottom surface of support
- Apply a 0.04" – 0.07" layer of Proseal 890 class B-2 on bottom of support and install wet.
- Install clamps and torque per dwg



P- 05625

EM(S) EXAMINED

ACCEPTANCE STD:

PM



THICKNESS

RESULTS

RESULTS. ☒ METRIC ☐ IMPERIAL)

1	CROSSBEE	W.O. ID	6959		✓
2	"	W.O. ID	72017		✓
3	"	W.O. ID	72254		✓
4	"	W.O. ID	71825		✓
5	"	W.O. ID	71824		✓
6	"	W.O. ID	72260		✓
7	"	W.O. ID	71437		✓
8	"	W.O. ID	72018		✓
9	"	W.O. ID	71438		✓
10	RAPPEL	W.O. ID	69692		✓

ITEM ID	D407-667-205	AFT
ITEM ID	D212-664-101MB	FWD
ITEM ID	D212-664-101	FWD
	D407-667-205	AFT
	D407-667-205	AFT
	D212-664-101	FWD
	D212-664-201	AFT
	D212-664-201MB	AFT
	D212-664-201	AFT

NO RELEVANT INDICATION WAS DETECTED
AS PER APPLICABLE STANDARDS

11 07-29

Scope of Services

Scope of Services

The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

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Standard of Care
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SIGNATURES

CLIENT REPRESENTATIVE

TECHNICIAN (SIGNATURE):

NAME (PRINT):

CGSB LEVEL

SNT LEVEL

CGSB REG. NO.

CGSB LEVEL

SNT LEVEL

CGSB REG. NO.

DTR # 64411

REPORT

REVIEWED BY:

NAME _____

INITIALS

WHITE - CLIENT COPY

CANARY - OFFICE COPY

PINK – TECHNICIAN COPY

GOLD - OFFICE COPY

PT Sept 2005

Work Order ID 71488

Tuesday, July 05, 2011 7:43:57 AM

Item ID: D212-664-201

Revision ID: U/R

Item Name: Crosstube Aft

Start Date: 7/5/2011 Start Qty: 1.00

Required Date: 7/25/2011 Req'd Qty: 1.00

Reference:

Approvals:

Process Plan:

QC:

Date: 11/07/05

Date:

Tooling:

SPC (Y/N):

Date:

Date:

Run

Start

Stop

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr

Revision Nbr

D212-664-241

Rev D U/R

100



DC

Document Control

DOCUMENT CONTROL

Memo

Photocopy bluefile and create labels as per PPP D212-664-201

CHG004

11-08-05

11-08-05

110



Packaging

Packaging

Pick Kit

Packaging

Memo

0.00

0.00

DP

11-7-27

120



CNC Bend 2

CNC Alpha 160 Bender

BENDING MACHINE - CROSSTUBES

Memo

Bend tube as per Dwg D212-664-241 using CNC bender program 212-aft

0.00

0.00

DP

11-7-27



Accept



Setup Start



Stop



Cust Item ID:

Customer: